



INTERNATIONAL PRELIMINARY EXAMINATION REPORT  
(PCT Article 36 and Rule 70)

Applicant's or agent's file reference KFE0081WO		<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/PEAA416)	
International application No. PCT/JP 03/08852	International filing date (day/month/year) 11.07.2003	Priority date (day/month/year) 18.07.2002	
International Patent Classification (IPC) or both national classification and IPC C08G75/02			
Applicant KUREHA CHEMICAL INDUSTRY COMPANY, LIMITED et al			

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 4 sheets, including this cover sheet.  
  
☐ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).  
  
 These annexes consist of a total of sheets.

3. This report contains indications relating to the following items:
  - I ☒ Basis of the opinion
  - II ☐ Priority
  - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
  - IV ☐ Lack of unity of invention
  - V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
  - VI ☐ Certain documents cited
  - VII ☐ Certain defects in the international application
  - VIII ☐ Certain observations on the international application

Date of submission of the demand  06.02.2004	Date of completion of this report  12.05.2004
Name and mailing address of the international preliminary examining authority:   European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer  Engel, S  Telephone No. +49 89 2399-7152 

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. PCT/JP 03/08852

**I. Basis of the report**

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

**Description, Pages**

1-33 as originally filed

**Claims, Numbers**

1-11 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
  - ☐ the language of publication of the international application (under Rule 48.3(b)).
  - ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).
3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:
- ☐ contained in the international application in written form.
  - ☐ filed together with the international application in computer readable form.
  - ☐ furnished subsequently to this Authority in written form.
  - ☐ furnished subsequently to this Authority in computer readable form.
  - ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
  - ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.
4. The amendments have resulted in the cancellation of:
- ☐ the description, pages:
  - ☐ the claims, Nos.:
  - ☐ the drawings, sheets:
5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

*(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)*

6. Additional observations, if necessary:

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International application No. **PCT/JP 03/08852**

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**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability;  
citations and explanations supporting such statement**

**1. Statement**

Novelty (N)	Yes: Claims	1-11
	No: Claims	
Inventive step (IS)	Yes: Claims	1-11
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-11
	No: Claims	

**2. Citations and explanations**

**see separate sheet**

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT - SEPARATE SHEET**

International application No. **PCT/JP03/08852**

Reference is made to the following documents:

- D1: PATENT ABSTRACTS OF JAPAN vol. 1998, no. 09, 31 July 1998 (1998-07-31) & JP 10 087831 A (TORAY IND INC), 7 April 1998 (1998-04-07)
- D2: EP-A-0 568 366 (KUREHA CHEMICAL IND CO LTD) 3 November 1993 (1993-11-03)
- D3: EP-A-0 259 984 (KUREHA CHEMICAL IND CO LTD) 16 March 1988 (1988-03-16)
- D4: EP-A-0 436 120 (PHILLIPS PETROLEUM CO) 10 July 1991 (1991-07-10)

**1 Novelty (Article 33(2) PCT)**

- 1.1 Present Claim 1, the claim with the broadest scope of protection, describes a production process for polyarylene sulphide (PAS) including a step of gradual cooling at defined average cooling speed and temperature range.
- 1.2 D1 discloses the production of granular polyphenylene sulphide including a step of slow cooling. In the abstract, no specification is made about the average cooling speed.
- 1.3 D2 deals with the production process of a poly(arylene ketone sulphide) in which a granular product is obtained after a cooling step.
- 1.4 D3 discloses a production process for PAS in which the temperature is lowered rapidly, then kept at the lower level for a while in order to obtain a granular product.
- 1.5 In D4, a production process for particular polyarylene sulphone is disclosed which comprises cooling of the reaction mixture at a speed of 0.5°C/min (cf. col.4, lines 18-21 and col.14, lines 46-47). The process includes aromatic dihalide and alkaline metal compound in polar solvent (cf. ex.1).
- 1.6 None of D1 - D4 appear to contain a teaching that the gradual cooling step should occur in a temperature range near to maximum system viscosity.
- 1.7 Accordingly, present Claims 1 - 11 appear to fulfil the requirements of A.33(2) PCT.

**2 Inventive Step (Article 33(3) PCT)**

- 2.1 The document D3 is regarded as being the closest prior art to the subject-matter of Claim 1. It discloses (cf. p.4, lines 38-40 and claim 1) a production process for granular PAS in which the reaction mixture is cooled rapidly until viscosity increases, then kept at the temperature of increased viscosity for a certain period of time.
- 2.2 From this, the subject-matter of present Claim 1 differs in that a defined cooling speed has to be observed.
- 2.3 This offers advantage in terms of process economy in a production process of PAS of controlled particle size.
- 2.4 Present claims 1-11 thus also appear to meet the requirements of A.33(3) PCT.